[0040]

Production Results for Experiment

Week of	Daily Milk (lbs.)	Milk Fat %	Milk Protein %
Before Egg Product			
March 31, 2000	84.5	3.59	3.00
February 7	nd	3.54	3.03
February 14	86.5	3.69	3.02
February 28	84	3.60	2.97
March 6	84	3.70	2.96
March 13	86.3	3.61	2.97
Average	85.0	3.62	2.99
Added 0.25 lb. Egg/day			
March 20	84.2	3.67	3.00
March 27	nd	3.70	3.00
April 3	nd	3.76	3.02
April 10	87.1	3.81	3.02
April 17	84.6	3.78	2.97
Average	85.3	3.74	3.00

nd = not determined

[0041] Experimental observations indicate that milk production levels are maintained while butterfat and milk protein levels are increased in dairy cows fed the instant feed compositions. It is important to note from the foregoing table that the daily milk fat yield was an average of 3.12 pounds per cow for the week beginning March 13, and the butterfat yield increased to 3.32 pounds per cow after feeding the Egg for four weeks. This 0.2 pound gain is a significant increase.

[0042] Using the April 2000 average butterfat value of $1.14/lb., feeding 0.25 pounds of Egg per day resulted in a $0.228 per cow per day financial benefit. At the same time, milk protein also increased, by 0.07 pounds per cow per day when Egg was fed. Milk protein in April 2000 was valued at $1.74/lb., which yielded an additional financial benefit of $0.122 per cow per day. Thus, feeding 0.25 pounds of Egg per day in this experimental herd was responsible for added income to the herdsman of $0.35 per cow per day.

[0043] In a second experiment employing the same methodology, similar improvements in milk fat production were seen. The herdsman reported that milk production remained approximately constant at 75 pounds per cow per day, while butterfat increased from 3.8% to 4.1%.

[0044] The skilled practitioner will recognize that these experimental results are unexpected and significant in light of prior efforts to increase butterfat and/or milk protein production. These results demonstrate that the present invention addresses a long-felt but previously unsolved need in the milk industry for an inexpensive, natural feed free from potentially harmful additives that can significantly increase butterfat and milk protein percentages, and thus increase the herdsman's income.

[0045] These improvements in butterfat and milk protein content are directly attributable to the nutritional profile of high quality inedible egg products according to the present invention. Fresh eggs are known to be a rich source of high quality protein. The egg white or albumen has a very high biological value in the amount and balance of amino acids. Egg albumen is frequently used as a reference to compare proteins from other sources when feeding animals such as the rat, mouse, chick, and others. The amino acid composition of whole hen's egg is used as the recommended profile for the Feed and Agriculture Organization's (1965) chemical score for required amino acids in protein (Galyean and Cotterill, 1995). High quality inedible egg products also contain various naturally occurring compounds with antimicrobial activity including, but not limited to, lysozyme that acts to hydrolyze β(1-4) glycosidic bonds in bacterial cell walls; ovotransferrin that acts to chelate Fe3+, Cu3+, Mn2+, Co2+, Cd2+, Zn2+, and Ni2+ to thereby render the minerals unavailable to bacteria until released by digestion of protein; avidin known to bind biotin thereby rendering it unavailable to bacteria until released by digestion of protein; ovoflavoprotein known to bind riboflavin thereby rendering it unavailable to bacteria until released by digestion of protein; and ovomucoid known to inhibit the action of various enzymes.

[0046] Prior efforts to increase butterfat and/or milk protein percentage have required the use of expensive, highly processed products that increase the herdsman's production costs and thereby diminish the return yielded by the higher market price for the improved butterfat and/or milk protein percentage milk. These prior efforts also have yielded only small improvements in butterfat and/or milk protein percentage and may introduce undesirable byproducts into the ruminant's milk.

[0047] The present invention avoids these drawbacks by providing a high quality, natural source of nutrition for far less cost and by improving both butterfat and milk protein percentages to a significant and unexpected degree. The present invention also provides a desirable amino acid profile for the ruminant that yields both healthier milk for the consumer and a healthier ruminant animal.

[0048] An additional benefit of the feed formulas of the present invention concerns the efficiency with which the instant formulas may be pelletized. The inedible egg fraction contained in the formula being pelleted serves as an excellent lubricant for the pelletizing apparatus. This makes the pelletizing equipment much more efficient than it is when pelletizing conventional dry feed formulations because it allows the pelletizing equipment to operate with a much lower power demand. This lower power demand decreases manufacturing costs for pelletized feed, and results again in a benefit to the herdsman of decreased feed costs for his or her animals. This also is an unexpected benefit of using high quality inedible egg products in a diet program for lactating ruminants.

[0049] Those of skill in the art will recognize that preferred diet programs incorporating feedstuff compositions according to the present invention are devised to meet the nutritional needs of the particular species being fed. Therefore, it is irrelevant what ingredients comprise the balance of feeds containing less than 100% high quality inedible egg, so long as those ingredients meet the nutritional requirements of the lactating ruminant for which the feed is intended. It is also irrelevant to the present invention when the skilled artisan decides to offer the present feed to the lactating ruminant, and it is irrelevant from which types of inedible egg the high quality inedible egg product is derived. What is relevant is that the various embodiments of the